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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/158,099	09/22/1998	KENJI MIWA	0163-0707-2X	3529

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EXAMINER

LIN, KUANG Y

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 10/10/2002

23

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/158,099

Applicant(s)

MIWA ET AL

Examiner

Kuang Y. Lin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15, 18 and 19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15, 18 and 19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Vives.

Vives discloses a grain refinement method for aluminum alloy (page 448, left col., last paragraph and right col., 4th complete paragraph) by applying an electric current and a magnetic field simultaneously (page 446, right col., 3rd complete paragraph and the junction paragraph between pages 447 and 448) to the molten aluminum alloy during a solidification process at temperature lower than a liquidus of the alloy (page 446, right col., last paragraph, page 447, right col., second complete paragraph and page 449, right col., 1st complete paragraph). Although he does not mention the feature of shifting a refined material to a periphery of a container to yield the refined material concentrated in an end portion of the metallic material, apparently, his process will produce the same result as that of applicants since he performs the identical process steps as that of applicants.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vives.

It would have obvious to use the container of any configuration in the process of Vives depending on the designated metallic cast article to be obtained.

6. Claims 15, 18 and 19 are also rejected under 35 U.S.C. 103(a) as being unpatentable over Radjai et al and further in view of Vives for the same reasons as set forth in the last office action.

Namely, Radijai et al substantially show the invention as claimed except they does not disclose to crush solid crystals into small pieces during a solidification process at temperatures lower than the liquidus. However, Vives discloses two distinct causes of grain refinement, represented by fluid flow and cavitation phenomena, in a solidifying liquid metal (see page 448, right col. last paragraph). In the absence of cavitation and for a sufficient intensity of the oscillating flow, the columnar-dendritic crystallization is replaced by a microstructure characterized by the formation of agglomeration of globular particles. On the

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other hand, when an alloy is solidified in the presence of well-developed cavitation situations, a very fine and homogeneous microstructure has been observed throughout ingot (see page 449, right col. second paragraph and page 454, left col. second paragraph). He also discloses that gas content in the liquid metal (see page 449, left col. second paragraph) and the intensity of magnetic pressure contribute to the cavitation phenomena (see page 449, left col. last paragraph through page 449, right col. last paragraph). It would have been obvious to manipulate the gas content of aluminum alloy and the magnetic pressure during the solidification process of Radjai et al in view of Vives such that to obtain well-developed cavitation situations in the molten metal at the temperature lower than the liquidus and thereby to better refine the grain structure.

7. Applicant's arguments filed September 30, 2002 have been fully considered but they are not persuasive.

The main argument of applicants is in that both prior art references do not show the claimed feature of applying an electric current and a magnetic field simultaneously to the solidifying molten metal at a temperature lower than the liquidus. However, Vives does show that features as stated in 2nd paragraph supra. Further, Radjai et al also shows to apply an electric current and a magnetic field simultaneously to a molten aluminum alloy. Thus, applicants' argument is moot.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kuang Y. Lin whose telephone number is 703-308-2322. The examiner can normally be reached on Monday-Friday, 10:00-6:30,.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X Nguyen can be reached on 703-308-3322. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7719 for regular communications and 703-305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

October 8, 2002

KUANG Y. LIN
EXAMINER
GROUP 320

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